

Amendments to the drawings

The attached proposed sheet of drawings includes changes to Figs. 11 and 12 and replaces the original drawing sheet of Fig. 11 and Fig. 12. The reference sign '78' in Fig. 11 has been replaced with '79.' The reference sign '78' at the top of Fig. 12 has been replaced with '79' since '78' refers to the solder mask layer over the pads 76 and 82.

Attachment: Replacement sheet

REMARKS

The Examiner is thanked for the thorough examination and search of the subject.

Claims 55-59 are pending. Claims 55-59 are currently amended; Claims 1-54 are canceled. The Specification and drawings have been amended because a single reference number 78 was used for two purposes. Reference number 78 is the solder mask in Figs. 12, 13, and 14. The Specification and drawing Figs. 11 and 12 have been amended to use reference number 79 to show the portion of the substrate not covered by the solder mask 78.

Response to Objection to Specification

Reconsideration of the objection to the amendment filed Apr. 28, 2006 under 35 U.S.C. 132(a) is requested based on the following remarks.

The previously-added subject matter that “the distance between an edge of the under bump metal layer and an edge of the metal pillar of the solder bump is greater than 0.2 microns” is supported in Figs. 3 and 4. It is believed that no new matter is added.

Withdrawal of the objection under 35 U.S.C. 132(a) is respectfully requested.

Response to Claim Rejection under 35 U.S.C. 112

Reconsideration of the rejection of Claim 57 under 35 U.S.C. 112, first paragraph is requested based on the following remarks.

The previously-added subject matter that “the distance between an edge of the under bump metal layer and an edge of the metal pillar of the solder bump is greater than 0.2 microns” is supported in Figs. 3 and 4. It is believed that no new matter is added.

Withdrawal of the rejection of claim 57 under 35 U.S.C. 112, first paragraph is respectfully requested.

Reconsideration of Claim 59 rejected under 35 U.S.C. 112, second paragraph, is requested based on the following remarks.

Withdrawal of rejection to Claim 59 under 35 U.S.C. 112, second paragraph, is respectfully requested as Claim 59 is currently amended.

Response to Double Patenting

Reconsideration of Claims 55-59 provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 53, 58, 59 and 67 of copending Application No. 10/935,451 is requested based on the following remarks.

Claim 55 is amended with the limitation that "a solder metal is bonded to a pad with a sidewall not covered by a solder mask", which is not disclosed in copending Application No. 10/935,451. Withdrawal of the provisional rejection to Claims 56-59 on the ground of nonstatutory obviousness-type double patenting is respectfully requested.

Response to Claim Rejections under 35 U.S.C. 102 and 103

Applicants respectfully traverse the rejections for at least the reasons set forth below.

Response to Claims 55-59

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As currently amended, independent claim 55 is recited below:

55. A circuit component, used to be connected to a substrate comprising a first pad with a sidewall not covered by a solder mask, comprising:

- a semiconductor device;
 - a metal pillar over said semiconductor device, wherein said metal pillar has a thickness of between 10 and 100 microns;
 - a metal layer over said metal pillar, wherein said metal layer has a bottom surface partially covered by said metal pillar and partially not covered by said metal pillar; and
 - a solder metal over said metal layer, wherein said solder metal is used to be bonded to said first pad.
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Reconsideration of the rejection of Claims 55, 56 and 58 under 35 U.S.C. 102(b) as being anticipated by US6,495,916 to Ohuchi et al. and of the rejection of Claims 57 and 59 under 35 U.S.C. 103(a) as being unpatentable over US6,495,916 to Ohuchi et al. is requested based on the following remarks.

Applicants respectfully assert that the circuit component claimed in claim 55 patentably distinguishes over the citation by Ohuchi et al. (US6,495,916).

Ohuchi et al. teach that a circuit component comprising a semiconductor device 1; a metal pillar 4 over said semiconductor device 1, wherein said metal pillar 4 has a thickness of between 10 and 100 microns; a metal layer 14 over said metal pillar 4, wherein said metal layer 14 has a bottom surface partially covered by said metal pillar and partially not covered by said metal pillar; and a solder metal 7 over said metal layer 14. ~
See *Fig. 7, lines 3-6, col. 3 and lines 31-36 col. 6 ~*

However, Ohuchi et al. fail to teach that said solder metal 7 may be bonded to a pad with a sidewall not covered by a solder mask, as claimed in amended claim 55.

The Examiner considers that the reference number of "2" can be deemed as said pad. ~ See *lines 11-12, page 6 in the last Office Action mailed Jul. 12, 2006 ~*

Applicants respectfully traverse the Examiner's opinion. Said pad 2 is on said semiconductor device 1, but is not on a substrate having said semiconductor device 1

mounted thereover. The first pad 74 indicated by Claim 55 is on a substrate 52 (see Fig. 12) and a solder metal 56 formed over a semiconductor device 50 can be bonded thereto (see Fig. 5), wherein the first pad 74 has a sidewall not covered by a solder mask 78, which is not anticipated by Ohuchi et al.

As to Claim 57, Ohuchi et al. fail to teach or suggest that the distance between a sidewall of said metal layer 14 and a sidewall of said metal pillar is greater than 0.2 microns. However, applicant teaches the distance between a sidewall of a metal layer and a sidewall of a metal pillar can be greater than 0.2 microns, so that the solder metal does not collapse through the sidewall of the metal pillar. This is not taught or suggested by Ohuchi et al.

For at least the foregoing reasons, applicants respectfully submit independent claim 55 patently distinguishes over the prior art references, and should be allowed. For at least the same reasons, dependent claims 56-59 patently define over the prior art as well.

CONCLUSION

Some or all of the pending claims are believed to be in condition for allowance. Accordingly, allowance of the claims and the application as a whole are respectfully requested.

It is requested that should Examiner Zarneke not find that the Claims are now Allowable that he call the undersigned at 845 452-5863 to overcome any problems preventing allowance.

Respectfully submitted,



Stephen B. Ackerman, Reg. No. 37,761

Attachment: Replacement sheet